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Comparative Analysis of Physico-Chemical Properties of AgNPs Synthesized from Different Parts of *Soymida febrifuga*

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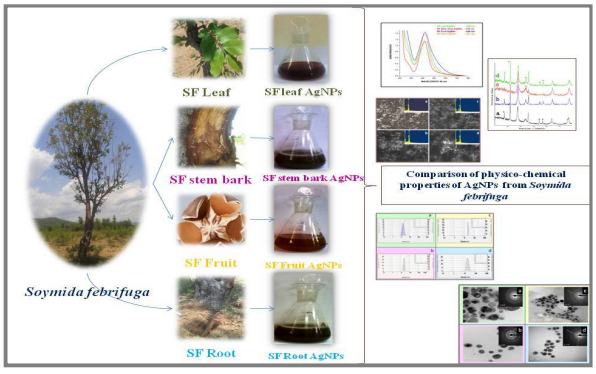
ABSTRACT

Soymida febrifuga an Indian medicinal plant is well known for its numerous therapeutic applications in Indian traditional system of medicine. It has been reported rich in phytoconstituents. In the current report, a comparative study of plant mediated silver nanoparticles (AgNPs) synthesized from aqueous extracts of different parts (leaf, stem bark, fruit and root) of SF was intended. The biosynthesized AgNPs were characterized using UV-Visible spectroscopy, Fourier Transform Infrared Spectroscopy X-ray diffraction , Scanning Electron Microscope-Energy Dispersive X-ray analysis (SEM-EDX), Nanoparticle analyzer (NPA) and Transmission Electron Microscope (TEM) to study and compare their physico-chemical properties. The spectroscopic characterization using UV-Vis and FTIR revealed the SPR resonance band between 400-430 nm and the phytoconstituents which have participated in the reduction and stabilization of the biosynthesized AgNPs, respectively. The XRD analysis revealed the face centered cubic) lattice structure in all the four SF-AgNP samples indicating the formation of crystalline AgNPs. The NPA analysis revealed the hydrodynamic diameter, zeta potential and the polydispersity index of the SF-AgNPs. The microscopic characterization using SEM and TEM displayed the structural and size features of the particles. The EDX spectra were recorded for the SF-AgNP samples to obtain the elemental profile which displayed silver as a major constituent. The study revealed that the aqueous fruit extract of SF yielded smaller AgNPs when compared to the other parts of SF.

Graphical Abstract



Keywords: *Soymida febrifuga*; Silver nanoparticles; Comparative analysis; Characterization.